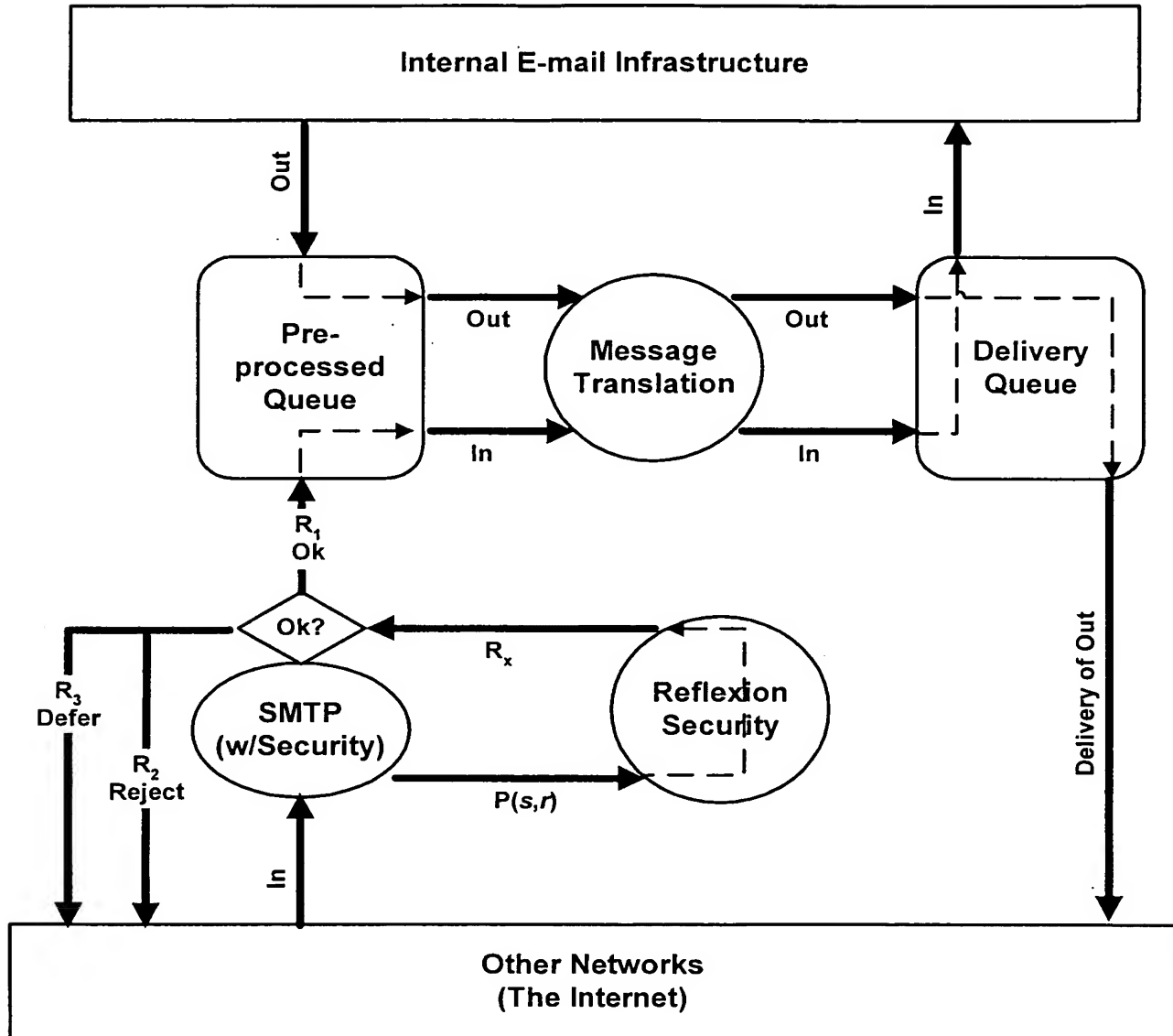
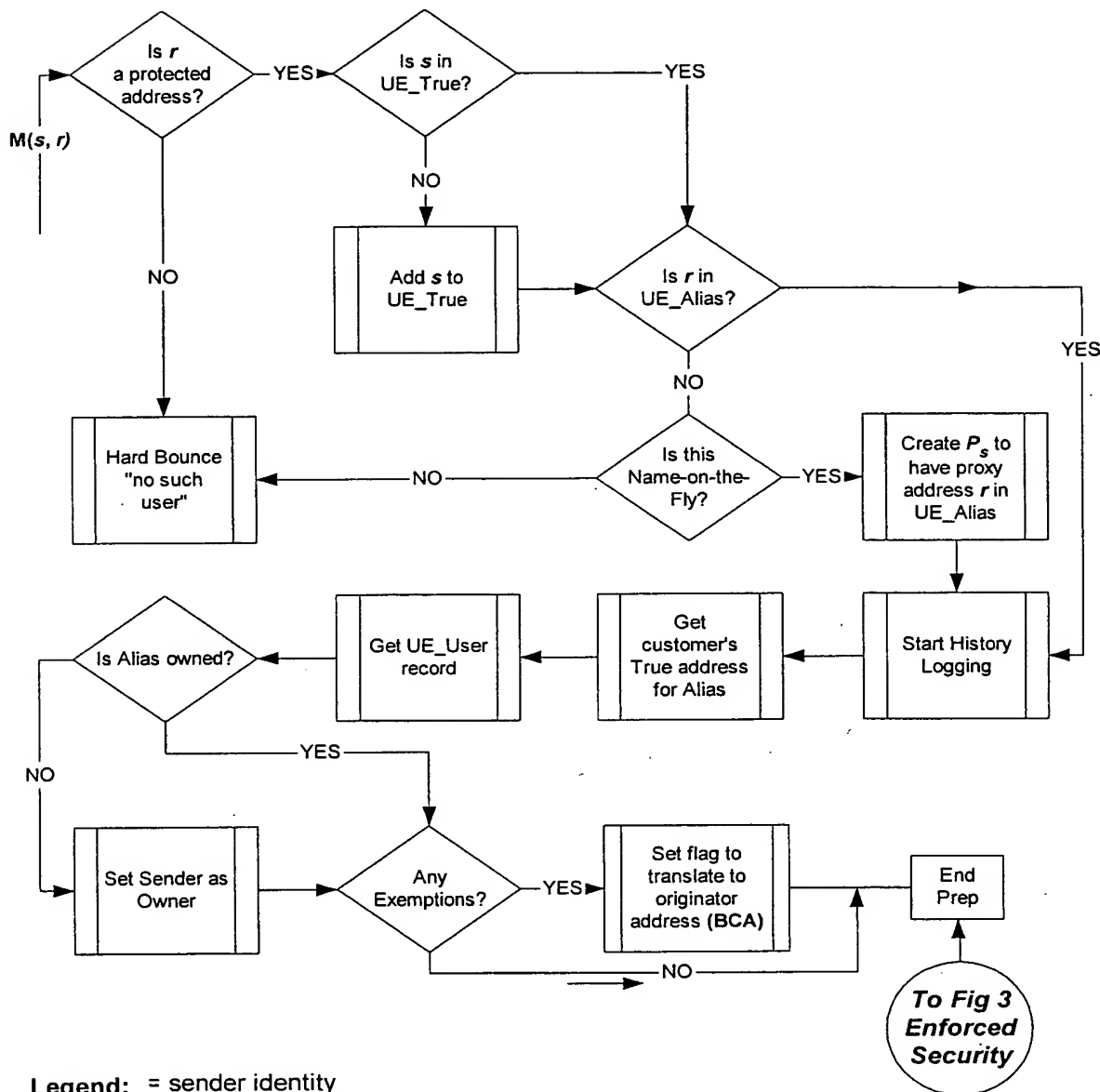


Fig. 1 Architecture

Legend: s = sender identity
 r = recipient identity
 $P(s,r)$ = Request security status on a message from s to r
 R_x = Security status on a message from s to r
 R_1 = Ok, continue processing message
 R_2 = Reject, do not process the message
 R_3 = Defer, temporarily defer the message back to the sending server

Fig. 2 Inbound Message Preparation

Legend: = sender identity

r = recipient identity

$M(s, r)$ = A message from s to r

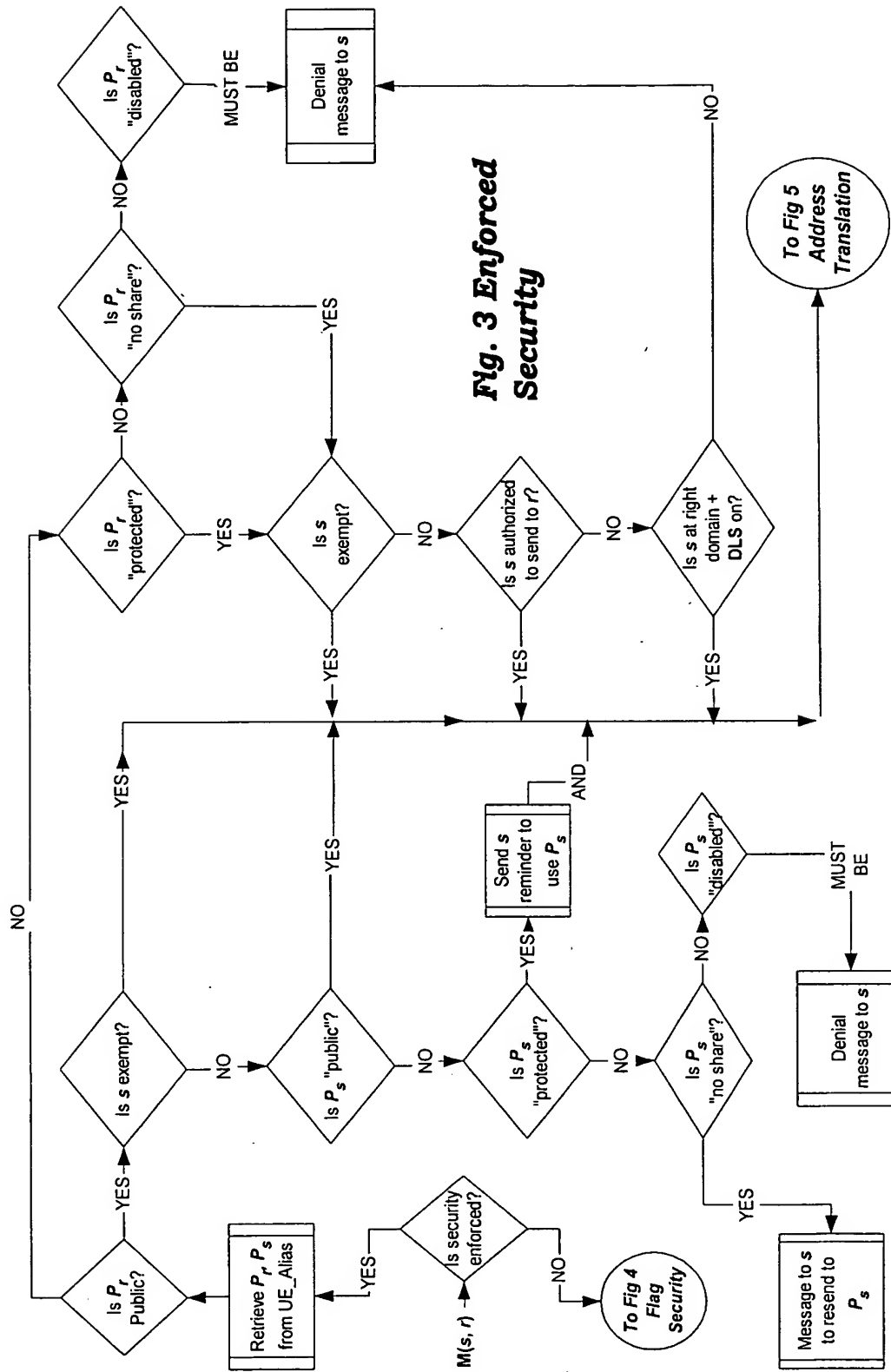
UE_TRUE is a database table containing "real" (i.e. non-proxy) addresses

UE_ALIAS is a database table containing proxy addresses

UE_User is a database table containing user information

BCA = "Business Card Address", the originator address managed by the internal mail transport agent (i. e. mail server)

P_s is the security settings for the proxy address registered to s for user that owns originator address to which proxy r is a substitute



Legend: s = sender identity

r = recipient identity

P_s is the security settings for the proxy address registered to s for user that owns proxy r

P_r is the security settings for the proxy address r

$$M(s,r) = \text{A message from } s \text{ to } r$$

UE_Alias is a database table containing proxy addresses

DLS stands for Domain Level Sharing

Note: It is possible for P_s to be the same object as P_r .

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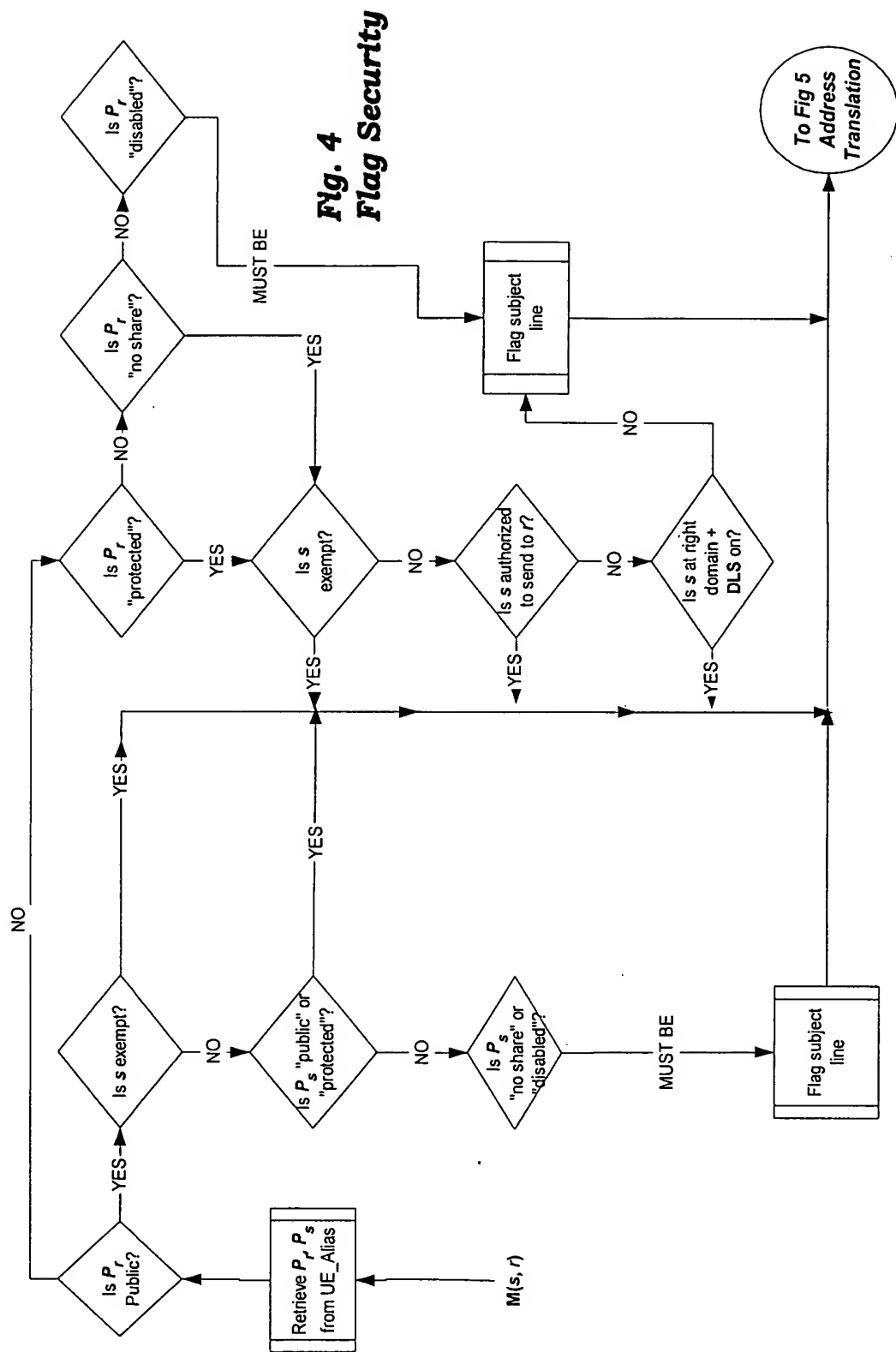


Fig. 5 Address Translations**"True" Identifiers (UE_True table)**

T1 = Inside Identifier 1
 T2 = Outside Identifier 1
 T3 = Outside Identifier 2
 T4 = Inside Identifier 2
 Tn = Outside Identifier n

s = sender identity

r = recipient identity

a = An address reference to translate

M(s,r) = A message from s to r

Proxy Identifiers (UE_Alias table)

$P_{(T2,T1)}$ = Substitute identifier for T1, registered to T2

$P_{(T3,T1)}$ = Substitute identifier for T1, registered to T3

$P_{(Tn,T1)}$ = Substitute identifier for T1, registered to Tn

$P_{(Tx,Tx)}$ = Tx, registered to Tx

T(a) = Method that returns translation of address a for a message from s to r

$D_{(Tx,T1)}$ = Method that returns the proxy P that Tx uses to send e-mail to T1.

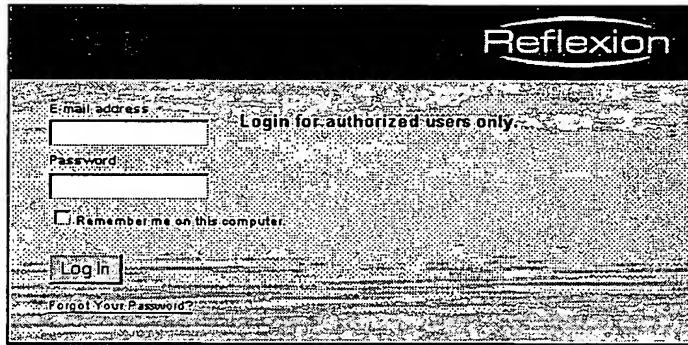
Sometimes $D_{(Tx,T1)} \neq P_{(Tx,T1)}$

INBOUND, successfully past security, where:

1. $a = r, s = T2, r = P_{(T2,T1)}$, then $T(a) = T1$
2. $a = r, s = T2, r = P_{(T3,T1)}$, then $T(a) = T1$
3. $a = P_{(T4,T4)}, s = T2, r = P_{(T2,T1)}$, then $T(a) = T4$
4. $a = P_{(T4,T4)}, s = T2, r = P_{(T3,T1)}$, then $T(a) = T4$
5. $a = T3, s = T2, r = P_{(Tx,T1)}$, then $T(a) = T3$
6. $a = P_{(Tx,Ty)}, s = T2, T2$ is exempt, $r = \text{any } P$, then $T(a) = Ty$

OUTBOUND, no security on outbound, where:

7. $a = r, s = T1, r = T2$, then $T(a) = P_{(T2,T1)}$
8. $a = r, s = T1, r = T2, D_{(T2,T1)} \neq P_{(T2,T1)}$, then $T(a) = D_{(T2,T1)}$
9. $a = r, s = T1, r = T2, D_{(T2,T1)} = P_{(T2,T1)}$, then $T(a) = P_{(T2,T1)}$
10. $a = r, s = T1, r = T2, r$ is exempt, then $T(a) = P_{(T1,T1)} [s]$
11. $a = T3, s = T1, r = T2$, then $T(a) = P_{(T3,T1)}$
12. $a = T3, s = T1, r = T2, D_{(T3,T1)} \neq P_{(T3,T1)}$, then $T(a) = D_{(T3,T1)}$
13. $a = T3, s = T1, r = T2, D_{(T1,T2)} = P_{(T2,T1)}$, then $T(a) = P_{(T3,T1)}$
14. $a = T3, s = T1, r = T2, T3$ is exempt, then $T(a) = P_{(T1,T1)} [s]$



Reflexion

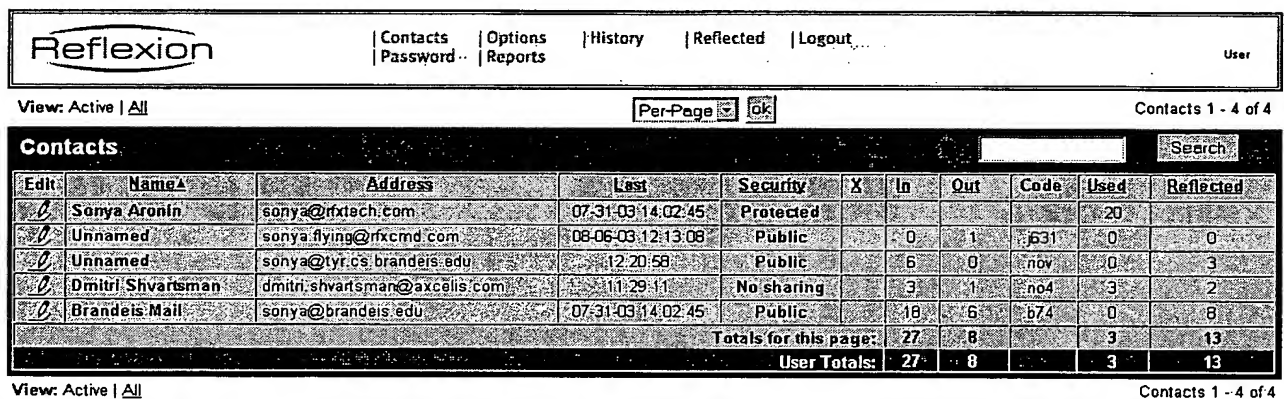
E-mail address: Login for authorized users only

Password:

☐ Remember me on this computer

[Forgot Your Password?](#)

FIG. 7 Login Page



Reflexion | [Contacts](#) | [Options](#) | [History](#) | [Reflected](#) | [Logout](#) | User

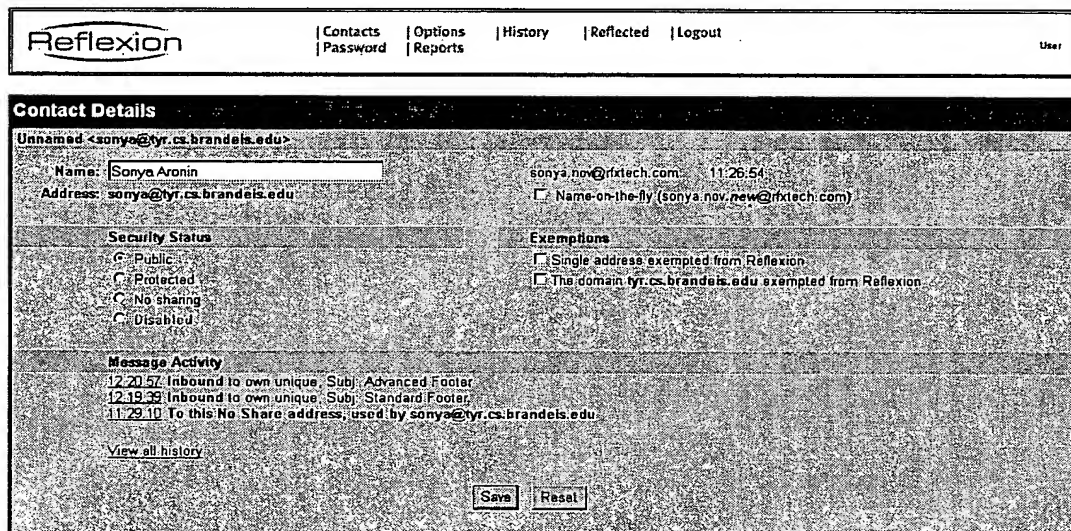
View: Active | All | Per-Page 20 | OK | Contacts 1 - 4 of 4

Contacts

Edit	Name	Address	Last	Security	X	In	Out	Code	Used	Reflected
	Sonya Aronin	sonya@rxtach.com	07-31-03 14:02:45	Protected					20	
	Unnamed	sonya.flying@rxcmd.com	08-06-03 12:13:08	Public		0	1	631	0	0
	Unnamed	sonya@tyr.cs.brandeis.edu	12-20-58	Public		6	0	nov	0	3
	Dmitri Shvartsman	dmitri.shvartsman@axcelis.com	11-29-11	No sharing		3	1	no4	3	2
	Brandeis Mail	sonya@brandeis.edu	07-31-03 14:02:45	Public		18	6	b74	0	8
Totals for this page:						27	8		3	13
User Totals:						27	8		3	13

View: Active | All | Contacts 1 - 4 of 4

FIG. 8 Contacts List



Reflexion | [Contacts](#) | [Options](#) | [History](#) | [Reflected](#) | [Logout](#) | User

Contact Details

Unnamed <sonya@tyr.cs.brandeis.edu>

Name: Address:

sonya.nov@rxtach.com 11-26-54

☐ Name on the fly (sonya.nov.new@rxtach.com)

Security Status

☒ Public
☐ Protected
☐ No sharing
☐ Disabled

Exemptions

☐ Single address exempted from Reflexion
☐ The domain tyr.cs.brandeis.edu exempted from Reflexion

Message Activity

12-20-57 Inbound to own unique, Subj: Advanced Footer
 12-19-59 Inbound to own unique, Subj: Standard Footer
 11-29-10 To this No Share address, used by sonya@tyr.cs.brandeis.edu

[View all history](#)

FIG. 9 Contact Details Page

Reflexion	Contacts	Options	History	Reflected	Logout
	Password	Reports			
		Options			

Options

User Properties

Your Name:

E-mail Address: [\(view properties\)](#)

Prefix:

Reflexion Properties

Mode: ☒ Enforce ☒ Keep copies of reflected messages
☐ Flag ☒ Append security codes to addresses
☐ Pass through
☐ Reverse ☐ Auto exempt on reply to flagged msgs

Message Footer: ☐ Standard ☒ Advanced ☐ No footer

FIG. 10 Reflexion User Options Page

Reflexion	New User	Exempts	History	Reports	Logout	Administrator
	Users					

Global Exemptions

Exempt a Domain or Address

Enter a valid e-mail address:

☒ Exempt the address
☐ Unexempt the address

☐ Exempt the entire domain
☐ Unexempt the entire domain [\(View Exempts\)](#)

FIG. 11 Administrator Add a Global Exemption Page

Reflexion

[| New User](#) [| Exempts](#) [| History](#) [| Reports](#) [| Logout](#)

New User

Enter the Name and Business Card Address (BCA) of the New User

Name:

Business Card Address:

@ rfxtech.com

Enter Additional Addresses that are linked to the BCA, such as old addresses that are still used

Additional Address 1:

@ rfxtech.com

Additional Address 2:

@ rfxtech.com

Additional Address 3:

@ rfxtech.com

User Type:

☒ Domain Group Administrator

☐ Normal User

Create

Reset

FIG. 12 Administrator Create New User Page